State of New Jersey
Department of Environmental Protection

DONALD T. DIFRANCESCO
Acting Governor

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DIVISION OF PUBLICLY FUNDED SITE REMEDIATION

STANDARD OPERATING PROCEDURE

TITLE: Standard Operating Procedure (SOP) for the Completion of the Hexavalent Chromium Data Validation Report Forms and the Preparation of the Final Data Validation Report.

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PURPOSE/SCOPE: This document is the Standard Operating Procedure (SOP) for the completion of the data validation report forms utilized in the data evaluation and validation of Hexavalent Chromium analyzed in accordance with NJDEP Modified USEPA SW-846 preparation/reagents 3060 and 7196A and the preparation of the Final Data Validation Report required by DPFSR.

ORIGINATING ORGANIZATIONAL UNIT(S): BEMQA

OTHER ORGANIZATIONAL UNIT(S) AFFECTED: ALL DPFSR and DRPSR

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I. PURPOSE AND SCOPE

This document is the Standard Operating Procedure (SOP) for the completion of the data validation report forms utilized in the data evaluation and validation of Hexavalent Chromium analyzed in accordance with NJDEP Modified USEPA SW-846 Methods 3060 and 7196A and the preparation of the Final Data Validation Report required by DPFSR.

II. AUTHORITY

This document was prepared under the authority of the Assistant Director, DPFSR-HSS and Bureau Chief, BEMQA. The revision, maintenance and use of this document is a work output under the NJDEP Quality Assurance Program Plan. The Quality Assurance Program Plan was prepared by the NJDEP Office of Quality Assurance and in part, by DPFSR-HSS-BEMQA.

III. REFERENCE

This document was prepared based on materials contained in the following documents:

A. NJDEP, Division of Publicly Funded Site Remediation, Hazardous Site Science Element, Standard Operating Procedure for Analytical Data Validation of Hexavalent Chromium, SOP No. 5.A.10, October 2001.

B. NJDEP Modified USEPA SW-846, Methods 3060 and 7196A.

IV. RESPONSIBILITY

The Assistant Director, HSS is responsible for the final review and approval of this document. The Chief of BEMQA is responsible for the annual review of this document. The Section Chief of QAS is responsible for the preparation of any revisions to this document as well as maintaining QAS staff compliance with this document.

V. POLICY

The actions contained in this document are the policy of DPFSR-HSS-BEMQA and are derived on the basis of requirements contained in the referenced NJDEP Modified USEPA SW-846 Methods 3060 and 7196A.

VI. PROCEDURE

A. Introduction

This section of the SOP consists of two distinct parts. The first part details the procedures utilized in the preparation of the final data validation report and the required format for the submittal of the data validation report. The second part details the procedures utilized in the completion of the Hexavalent Chromium Data Validation Report Forms that are to be utilized during the evaluation and data validation of Hexavalent Chromium analytical data generated using NJDEP Modified Methods 3060 and 7195A USEPA SW-846 protocol.

B. Data Validation Report

1. OVERVIEW OF REQUIREMENTS

Upon completion of sample data validation for a given batch of samples, an original and one copy of a three part data validation report must be submitted to NJDEP-DPFSR. Specifically, the report consists of:

a. *Cover Letter* - addressed to an assigned NJDEP representative, this letter highlights the samples and fractions reviewed and any major deficiencies or QA problems encountered during data validation. Any sample rejections must be identified here. Additional information about the cover letter is presented in Section VI.B.2 of this SOP.

b. *Target Analyte Summary Hitlist* - provides data end-user a summary of the results of the samples reviewed, the data validation qualifiers added, and the final data validation decisions on acceptance, qualification, or rejection of the result. A detailed explanation of this deliverable is presented in Section VI.B.3 of this SOP.

c. *Data Validation Report Forms* - deliverable used during the data validation process to assess the technical merit of the laboratory's performance. These forms allow the data end-user to easily locate detailed quality assurance information related to any specific sample within the sample set. Detailed instructions for completing these forms and a complete set of blank forms are presented in Section VI.C. of this SOP.

2. COVER LETTER

a. The cover letter highlights the samples that were reviewed and all major quality

assurance deficiencies or problems that were encountered during data validation. The report must include the following:

1) Names of all reviewers conducting the data validation.

2) Listing of all samples reviewed. The samples are to be listed by the field ID number and the associated laboratory ID number and matrix. The data reviewer shall choose either ID and utilize that ID on the detailed data validation report forms.

3) All trip blanks, field blanks and QC samples must be identified.

4) The pages of the cover letter must be numbered.

5) The cover letter must be securely bound along the left margin. Stapling is not permitted. The Target Analyte Summary and the accompanying data validation report forms shall be bound with the cover letter to form the complete data validation report.

6) Letter Quality print is required. Compression of the print and/or dot matrix print is not acceptable.

7) The cover letter must be delivered on 8.5 inch x 11 inch paper.

b. Format of Cover Letter

1) A complete cover letter will consist of three (3) sections, a section on pertinent sample information, a general comments section and a data quality and recommendations section.

2) The structure of each section should be in a narrative format and provide explanation as to why any sample(s) is rejected. All qualifications and rejections whether by fraction or sample are to be listed and explained. The identification numbers for any sample rejected or qualified must be provided.

3) The cover letter is to be broken down in the following manner.

a) Sample Information - This section is to include laboratory and field identification numbers and sample matrix.

b) General Comments- This section is to include information on the completeness and quality of the data deliverable package general requirements.

c) Data Quality and Recommendation - This section is to include information on the quality of the data that was validated and overall recommendations.

3. TARGET ANALYTE SUMMARY (HITLIST)

a. The Target Analyte Summary (Hitlist) provides the data end user with the concentration of Hexavalent Chromium in all of the samples reviewed.

b. For each sample reviewed, the final data validation decision on the acceptance, qualification or rejection of the results with the appropriate footnote(s) is provided.

c. General Requirements

1) Deviations from the provided Target Analyte Summary (Hitlist) format are not acceptable.

2) Letter quality print is required. Compression of the print and/or dot matrix print is not acceptable.

3) The Hitlist must be delivered on 8.5 inch x 11 inch paper.

4) The pages of the Hitlist must be numbered. Page number format shall be as follows: page of .

5) The Hitlist must be securely bound along the left margin. Stapling is not permitted. The Hitlist, the accompanying footnotes and the data validation report forms shall be bound with the cover letter to form the complete data validation report.

6) Trip and field blanks associated with a given group of field samples are to be listed on the Hitlist first, followed by the associated field samples.

7) The column headings shall include: Site name, SDG and NJDEP job numbers, laboratory name, sampling date, sampling matrix and fraction are to be provided at the top of every page.

8) The column headings are to be provided at the top of every page in the hitlist.

9) The footnotes and footnote numbers are based on the NJDEP-DPFSR current list of footnotes. The list of NJDEP-DPFSR footnotes **can be revised** or renumbered.

10) Sample field identification numbers or laboratory identification numbers are listed on the left hand side of the paper in the first column. The concentration units for the results are to be listed next to the fraction name.

11) The analyte name is listed at the left margin below the field or laboratory identification number in column two.

12) The results for the associated preparation/reagent blank are listed in column three. The letter U is required if the analyte was not detected above the MDL in the preparation/reagent blank. If the preparation/reagent blank is associated with soil samples, the preparation/reagent blank must be reported in mg/kg.

13) The laboratory reported concentration is listed in column four.

14) The data reviewer's reported concentration is to be listed in the fifth column.

    a) If the reviewer agrees with the number reported by the laboratory, it still must be listed.

    b) If the concentration reported by the laboratory is incorrect, it must be corrected in this column.

    c) If the concentration reported by the laboratory is rejected, a line consisting of three hyphens is to be inserted in the column.

    d) If the sample is a field or trip blank associated with soil samples, the trip or field blank must be reported in mg/kg.

15) The quality assurance decision is to be listed in the sixth column. This consists of single word descriptors with more detailed explanation using footnotes in column seven. The descriptors are required only if the analyte reported by the laboratory requires a quality assurance action. If the analyte result reported by the laboratory is acceptable, this column is left blank for that analyte. The following descriptors must be used in the

sixth column.

a) negate - used when the presence of a given analyte in a sample can be attributed to laboratory/field introduced contamination.

b) qualify - used when the results of a given analyte in a sample do not meet all QA/QC criteria but are not severe enough to warrant data rejection.

c) reject - used when the results of a given analyte in a sample do not meet all QA/QC criteria so that the qualitative presence and/or quantitation of that analyte in the sample cannot be determined with any degree of confidence.

16) Footnote numbers are to be listed in the seventh column. A given analyte can have more than one footnote. If an analyte is rejected, all footnotes describing the rejection are required. If an analyte is negated, only the footnote that describes the negation is required.

d. Footnotes for Target Analyte Summary (Hitlist)

Listed below are the footnotes and footnote numbers that shall be used on the Hitlist. These footnotes can be revised or renumbered.

1) The value reported is less than or equal to 3x the value in the preparation/reagent blank. It is the policy of NJDEP-DPFSR to negate the reported value due to probable foreign contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

2) The value reported is greater than three (3) times but less than ten (10) times the value in the preparation/reagent blank and is considered "real". However, the reported value must be quantitatively qualified "J" due to the preparation/reagent blank contamination. The "B" qualifier alerts the end-user to the presence of this analyte in the preparation/reagent blank.

3) The value reported is less than or equal to three (3) times the value in the trip/field blank. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign contamination unrelated to the

actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

4) The value reported is greater than three (3) times but less than ten (10) times the value in the trip/field blanks and is considered "real". However, the reported value must be quantitatively qualified "J" due to trip/field blank contamination.

5) The concentration reported by the laboratory is incorrectly calculated.

6) The laboratory failed to report the presence of the analyte in the sample.

7) The reported Hexavalent Chromium value was qualified because the Calibration Check Standard was not within the recovery range (90-110 percent).

8) In the Duplicate Sample Analysis, Hexavalent Chromium fell outside the control limits of $\pm$ 20 percent or $\pm$ 2ppm. Therefore, the result was qualified.

9) This analyte was rejected because the laboratory performed the Duplicate Analysis on a field blank.

10) The reported value was qualified because the PVS recovery was greater than 115 percent.

11) The reported value was qualified because the PVS recovery was less than 85 percent.

12) The non-detected value was qualified (UJ) because the PVS recovery was less than 85 percent. The possibility of a false negative exists.

13) The reported analyte was qualified because the associated Calibration Blank result was greater than the MDL.

14) The laboratory made a transcription error. No hits were found in the raw data.

15) This analyte is rejected because the laboratory exceeded the holding time for digestion and analysis.

16) The laboratory subtracted the preparation/reagent blank from the sample

result. The Reviewer's calculation puts the preparation/reagent blank back into the result.

17) The photocopy is unreadable. Therefore, the QA reviewer cannot read the laboratory's reported concentration result.

18) The reported value was qualified because the predigestion spike recovery was less than 75 percent.

19) The reported value was qualified because the predigestion spike recovery was greater than 125 percent.

20) The non-detected value was qualified (UJ) because the redigestion spike recovery was less than 75 percent. The possibility of a false negative exists.

21) The reported result was rejected because the laboratory did not record the pH value(s) of the sample in a laboratory notebook.

C. Hexavalent Chromium Data Validation Report Forms

These are the instructions for the completion of the Hexavalent Chromium Data Validation Report Forms. Throughout the document, various decisions are required to be made by answering questions. Instructions on answering the questions are not provided. These are provided in the SOP No. 5.A.10 for the Quality Assurance Data Validation of Hexavalent Chromium.

A limited number of QA actions are provided on the forms. The SOP No. 5.A.10 DPFSR details all the QA actions to be utilized in the data validation process.

HEXAVALENT CHROMIUM FORM 1 - Data Deliverable Requirements

This form needs only to be filled out once per deliverable batch. The ten items reflect the overall quality of the deliverable package and NJDEP requirements. The reviewer shall fill in the site name, location, laboratory name, reviewer name, the date when the review was started, job code, site manager, Bureau and what methodology was used. The following items, lettered A through J must be completed by the reviewer by indicating a yes or no

answer for each item. For "no" responses, space is provided at the lower portion of the form to describe any deviations from requirements.

HEXAVALENT CHROMIUM FORM 2 - Holding Times for Hexavalent Chromium

This form must be filled out for every sample reviewed. The reviewer shall choose which sample ID he/she will use throughout the validation by circling the appropriate ID in the first column. In the next column, the reviewer will enter the sample matrix. The date of sample collection is specified on the chain of custody form. The analysis date for Hexavalent Chromium is taken either from the digestion logs or the raw data. If the holding time for analysis was exceeded, the reviewer must report the number of days the holding time was exceeded by in the holding time exceeded column.

HEXAVALENT CHROMIUM FORM 3 - Instrument Calibration Curve and Calibration Check Standard (CCS) for Hexavalent Chromium

This form must be completed for all samples. All field samples, field/trip blanks and field duplicates must be listed on the line provided. If the CCS is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer indicates whether the instrument used was properly standardized.

2. The reviewer must review the raw data to verify that the CCS was analyzed at the proper frequency.

3. The reviewer must review the raw data to verify that the CCS concentration was the same throughout the analysis.

4. A listing is done for the percent recovery of Hexavalent Chromium failing to meet QC criteria.

5. Calculate the percent recovery of Hexavalent Chromium for one CCS standard and compare to the laboratory's reported result.

HEXAVALENT CHROMIUM FORM 4 - Calibration Blank (CB) for Hexavalent Chromium

This form must be completed for all samples. All field samples, field/trip blanks and field duplicates must be listed on the line provided. If the CB is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer verifies that a CB was analyzed before the instrument's initial calibration standards.

2. The reviewer verifies that a CB was analyzed after the CCS.

3. The reviewer verifies that the value for Hexavalent Chromium in the CB was below the MDL.

HEXAVALENT CHROMIUM FORM 5 - Preparation/reagent Blank Summary for Hexavalent Chromium

This form must be filled out for every Preparation/reagent blank reviewed. The reviewer shall circle which matrix the Preparation/reagent blank is associated with and the concentration units. The reviewer must fill in the Preparation/ Reagent blank ID that can be found in the digestion log or the raw data. All field samples, field/trip blanks and field duplicates must be listed on the line provided. If the Preparation/reagent Blank is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer verifies that a Preparation/reagent blank was analyzed for each matrix and at the correct frequency.

2. Under the column for concentration, report the concentration of Hexavalent Chromium if it is greater than the IDL.

3. Under the MDL column, write the word "Yes" if the concentration of Hexavalent Chromium is less than the MDL, or the word "No" if the concentration of Hexavalent Chromium is greater than the MDL.

4. Under the IDL column, write the word "Yes" if the concentration of Hexavalent Chromium is greater than the IDL, or the word "No" if the concentration of

Hexavalent Chromium is less than the IDL.

5. Under the Comments/Action column, list any decisions that must be made when the concentration of Hexavalent Chromium is above the MDL.

HEXAVALENT CHROMIUM FORM 6 - Predigestion Spike Analysis for Non Aqueous Hexavalent Chromium Samples

General Information - Write in the sample ID used for predigestion spike analysis, enter the percent solids for the sample used for sample spike analysis.

This form must be completed for all samples. All associated non-aqueous field samples, and field duplicates must be listed on the line provided. If the Predigestion Spike Analysis is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer must verify the frequency of the predigestion spike analysis.

2. The reviewer must verify that the laboratory did use a field sample for predigestion spike analysis.

3. The reviewer determines if the proper predigestion spike concentration was used.

4. The reviewer determines if the predigestion spike recovery for Hexavalent Chromium met QC criteria.

5. Calculate the percent spike recovery of Hexavalent Chromium in the predigestion spike analysis performed as indicated and compare to the laboratory's reported result.

HEXAVALENT CHROMIUM FORM 7 - Post Verification Spike Sample (PVS) Analysis for Hexavalent Chromium

General Information - Write in the sample ID used for PVS, circle the appropriate matrix, fill in the percent solids (when applicable) for the sample used for PVS analysis, and circle the appropriate units.

This section contains two forms that must be completed for all samples. All associated

field samples and field duplicates must be listed on the line provided. If the PVS is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer must verify that the proper frequency and concentration for the post verification spike sample.

2. The reviewer must verify that the laboratory did use a field sample for post verification spike sample.

3. a. The reviewer determines if the PVS recovery for Hexavalent Chromium met QC criteria.

   b. The reviewer determines that if the PVS recovery was less than 85% the laboratory reanalyzed the sample.

4. Calculate the percent recovery of Hexavalent Chromium in the PVS sample and compare to the laboratory's reported result.

HEXAVALENT CHROMIUM FORM 8 - Duplicate Analysis for Hexavalent Chromium

This form must be completed for all samples. All field samples and field duplicates must be listed on the line provided. If the Duplicate Analysis is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

General Information - Write in the sample ID used for duplicate analysis, circle the appropriate matrix, fill in the percent solids, when applicable, for the sample used for duplicate analysis, and circle the appropriate units.

1. The reviewer must verify the frequency of the duplicate analysis.

2. The reviewer must verify that the laboratory did use a field sample for duplicate analysis.

3. The reviewer must verify if the RPD of Hexavalent Chromium met QC criteria.

4. Calculate the RPD for Hexavalent Chromium and compare to the laboratory's result.

HEXAVALENT CHROMIUM FORM 9 - Laboratory Control Sample (LCS) for Hexavalent Chromium

This form must be completed for all samples. All field samples and field duplicates must be listed on the line provided. If the LCS is associated with all samples analyzed, the reviewer may enter the word "All". The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

General Information - circle the appropriate matrix and units.

1. The reviewer must verify the frequency of the LCS analysis.

2. The reviewer will also qualify Hexavalent Chromium concentrations if the LCS did not meet the QC criteria of 80%-120%.

3. Calculate the LCS percent recovery for Hexavalent Chromium as indicated and compare to the laboratory's reported result.

HEXAVALENT CHROMIUM FORM 10 - Sample Result Verification for Hexavalent Chromium

This form must be completed for all samples. All field samples, field/trip blanks, and field duplicates must be listed on the line provided. The sample ID is the same as that chosen by the reviewer in the holding time form. All questions are to be answered and, where indicated, the quality assurance action noted.

1. The reviewer must verify that samples reported were within the calibration range.

2. The reviewer must check for any anomalies in the raw data.

3. The reviewer must check for any computation or transcription errors.

4. The reviewer must verify that the laboratory provided the pH readings, for methods 3060 & 7196A, for all samples and the results were within method requirements.

5. The reviewer must verify that the hotplate temperatures were provided and within method requirements.

6. Calculate the percent solids for one sample as indicated and compare to the

laboratory's reported result.

7. Calculate the concentration for one non-aqueous sample for Hexavalent Chromium.

DATA DELIVERABLE REQUIREMENTS
for
HEXAVALENT CHROMIUM

Site Name_____Job Code_____

Location_____ Site Manager_____

Laboratory Name_____ Lead Division/Bureau_____

Reviewer_____
Methodology_____

Date of Review_____ SDG_____

GENERAL REQUIREMENTS: Circle YES or NO and list the deviations at the bottom:

A.	Permanently Bound	Yes	No	G.	Methodology Review	Yes	No
B.	Paginated	Yes	No	H.	Uninitialed Strikeovers	Yes	No
C.	Title Page	Yes	No	I.	Legible Xerox	Yes	No
D.	Table of Contents	Yes	No	J.	Consistent Dates	Yes	No
E.	Chain of Custody	Yes	No				
F.	Non-conformance Summa	Yes	No				

Describe any deviations from the requirements
_____

_____
_____

_____

_____

_____

_____

HOLDING TIMES

Sample ID Field or Lab	Matrix	Date of Sample Collection	Hex Chrome Analysis Date	Holding Time Exceeded	QA Decision
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

List any samples that exceeded the holding time, the number of days exceeded by and QA decision.

_____

_____

_____

INSTRUMENT CALIBRATION CURVE
and
CALIBRATION CHECK STANDARD (CCS)

ASSOCIATED SAMPLES
_____

_____
_____

1. Was the instrument properly standardized? Yes No
   If no, explain and list action.
   _____
_____
   _____

_____
__

2. Was the CCS analyzed at the proper frequency? Yes No
   If no, explain and list action.
   _____
_____
   _____

_____
__

3. Was the same CCS concentration used throughout the analysis? Yes No
   If no, list action.
   _____
_____
   _____

_____

__

4. Does the CCS standard meet the QC requirements of 90-110% recovery ?

Yes No

If no, list the % recovery, and action.

_____
_____
_____

_____
__

5. Show calculation for the % recovery of Hexavalent Chromium in the CCS standard.

Lab value _____

CALIBRATION BLANKS

ASSOCIATED SAMPLES
_____

_____
_____

1. Was the calibration blank analyzed before the instrument's initial calibration standards? Yes No

   If no, list action.
_____

   _____
_____

2. Was a calibration blank analyzed after the calibration check standard?
   Yes No

   If no, list associated samples and action.

   _____
_____

   _____
_____

3. Was the value of Hexavalent Chromium for the continuing calibration blank below the MDL?
   Yes No

   If no, list associated samples and qualify them.

   _____
_____

   _____
_____

PREPARATION/REAGENT BLANK SUMMARY

Preparation/Reagent Blank ID_____

Sample matrix: Soil Water

Units: mg/kg ug/L

Does the frequency of the preparation/reagent blank analysis meet method requirements?

Yes No

If no, explain and note action

_____

_____

_____

ANALYTE	CONCENTRATION	< MDL	>IDL	COMMENTS / ACTION
Hexavalent Chromium				

ASSOCIATED SAMPLES

_____

_____

_____

_____

PREDIGESTION SPIKE ANALYSIS

Spike Analysis performed on sample _____ %
Solids_____

Sample matrix: Soil Units: mg/kg

ASSOCIATED SAMPLES
_____

_____
_____

1. Was the predigestion spike analysis performed at the correct frequency?
Yes No

If no, note deviations and action
_____

_____
_____

2. Was the predigestion spike analysis performed on a field sample?
Yes No

If no, reject all associated
samples._____

_____
_____

3. Was the predigestion spike analysis performed at the proper concentration?
Yes No

If no, qualify the associated
samples._____

_____
__

4. Did the % recovery for hexavalent chromium meet the criteria of 75-125 % ?

Yes No
If no, list action.

_____

_____

_____

5. Show calculation for predigestion spike recovery of Hexavalent Chromium.

Lab value

_____

POST VERIFICATION SPIKE ANALYSIS

Post Verification Spike (PVS) performed on sample _____

Sample matrix: Soil Water % Solids_____

Units: mg/kg ug/L

ASSOCIATED SAMPLES

_____

_____

_____

1. Was PVS analysis performed at the correct frequency and proper concentration?

Yes No

If no, list action.

_____

_____

_____

2. Was PVS analysis performed on a field sample? Yes No

If no, list action_____

_____

_____

3. a. Does the PVS recovery meet the criteria of 85-115%? Yes No

If no, list action_____

_____

_____

b. If the PVS recovery was less than 85%, did the laboratory reanalyze the

sample? Yes No

If no, list action_____

_____

_____

4. Show the calculation for % recovery for PVS.

Lab value _____

DUPLICATE ANALYSIS

Duplicate Analysis performed on sample _____ %
Solids_____

Sample matrix: Soil Water

Units: mg/kg ug/L

ASSOCIATED SAMPLES
_____

_____
_____

1. Was the Duplicate analyses performed at the correct frequency? Yes No
If no, list
action._____

_____
_____

2. Was the duplicate analysis performed on a field sample? Yes No
If no, reject all associated samples.
_____
_____

_____
_____

3. Does the duplicate analysis meet the QC control limits? Yes No
If no, qualify the associated samples.
_____
_____

_____
_____

4. Show the calculation for RPD for Hexavalent Chromium.

Lab value

_____

LABORATORY CONTROL SAMPLE

Sample matrix: Soil Water

Units: mg/kg ug/L

ASSOCIATED SAMPLES

_____

_____

_____

_____

1. Was the laboratory control sample performed at the correct frequency? Yes No

   If no, list action.

   _____

   _____

2. Does the LCS meet the QC limit of 80-120 % Yes No

   If no, list the % recovery and action.

_____

   _____

   _____

3. Show the calculation for the LCS % recovery for hexavalent chromium.

Lab Value

_____

SAMPLE RESULT VERIFICATION

ASSOCIATED SAMPLES
_____

_____
_____

1. Were all samples reported within the calibration range? Yes No

If no, list affected samples and action._____

_____
_____

2. Was the raw data free of any anomalies? Yes No

If no, list affected samples and action._____

_____
_____

3. Was the data package free of any computational or transcription errors? Yes No

If no, list affected samples and action._____

_____
_____

4. Were both 3060 & 7196A pH readings provided and within method requirements? Yes No N/A

If no, list affected samples and action._____

_____
_____

5. Were the hotplate temperatures provided and within method requirements? Yes No N/A

If no, list affected samples and action._____

_____
_____

6. Show the calculation for % solids for one sample. N/A

Lab value _____

7. Show the calculation for a nonaqueous sample. Lab value _____